CONTENTS OF VOL. 61 Nos 1–6

NUMBER 1—JANUARY

PART A

PAGE

A computer simulation study of the defect structure of calcia-stabilized zirconia
By A. Dwivedi and A. N. Cormack 1

Simulation of images of spherical strain centres in X-ray section topographs
By G. S. Green, Cui Shu Fan and B. K. Tanner 23

Influence of the mean crystal potential on the Fresnel fringes in cross-sectional transmission electron microscopy bright-field images of a flat projecting Si/SiO_2 interface
By P. Wurzinger, P. Pongratz and P. Skalicky 35

High-resolution study of supported bismuth clusters
By G. Fuchs, M. Treilleux, F. Santos Aires, B. Cabaud, A. Hoareau and P. Melinon 45

On the correlation of grain geometry changes during deformation at various temperatures to the operative deformation modes
By K. J. Kurzydłowski, K. J. McTaggart and K. Tangri 61

The dislocation-free zone model of mode-III fracture: a discrete dislocation approach
By Sham-Tsong Shiue and Sanboh Lee 85

Atomistic calculations of point-defect interactions with an edge dislocation in NiO
By J. Rabier, J. Soullard and M. P. Puls 99

The influence of temperature and alloying additions on the mechanisms of plastic deformation of Ti_3Al
By S. A. Court, J. P. A. Löfvander, M. H. Loretto and H. L. Fraser 109

Deformation mechanisms in the intermetallic compound TiAl
By S. A. Court, V. K. Vasudevan and H. L. Fraser 141

On the origin of the intrinsic thermoelasticity associated with a single-interface transformation in Cu–Zn–Al shape-memory alloys
By F. C. Lovey, A. Amengual, V. Torra and M. Ahlers 159

PART B

Homogeneous nucleation via atomic density fluctuations in undercooled liquid metals
By P. Desré, A. R. Yavari and P. Hicter 1

PAGE

Stability of HgNa and HgK liquid alloys
By I. S. JHA, R. N. SINGH, P. L. SRIVASTAVA and N. R. MITRA 15

Electronic transport in silicon backbone polymers
By M. A. ABKOWITZ, M. J. RICE and M. STOLKA 25

Charge-carrier transport in poly(n-propylmethylsilane) over a wide temperature range encompassing the glass transition and the melting point
By KENJI YOKOYAMA and MASAAKI YOKOYAMA 59

Elastic anomalies in the high-temperature cubic phase of some A_2BX_6 compounds
By N. WRUK, J. PELZL, K.-H. HÖCK and G. A. SAUNDERS 67

Electrical transport properties of molybdenum tellurite glassy semiconductors
By A. GHOSH 87

Microwave conductivity investigations of plastically deformed silicon
By M. BROHL, M. DRESSEL, H. W. HELBERG and H. ALEXANDER 97

Electron-irradiation-induced crystalline to amorphous transition in α-SiC single crystals
By H. INUI, H. MORI and H. FUJITA 107

Book reviews 125

NUMBER 2—FEBRUARY

PART A

Deviation from icosahedral symmetry in rapidly solidified $Al_6Cu(Li, Mg)_3$ icosahedral phase
By D. H. KIM, J. L. HUTCHISON and B. CANTOR 167

Electron microscope studies of lattice defects in pseudo-one-dimensional crystal of Nb_3Te_4
By K. SUZUKI, M. ICHIHARA, I. NAKADA and S. TAKEUCHI 193

The top–bottom *N*-beam phase contrast effect from finite crystals. II. Theory
By P. GOODMAN, A. E. C. SPARGO, L. C. QIN and K. ISHIZUKA 205

Martensitic transformation quenching effects in Cu–Zn–Al shape-memory alloys
By A. PLANES, J. L. MACQUERON, R. RAPACIOLI and G. GUÉNIN 221

The plasticity of GaAs between 415 and 730°C
By H. SIETHOFF, R. BEHRENSMEIER, K. AHLBORN and J. VÖLKL 233

What kind of information can we expect from combined direct and indirect lattice imaging in an electron microscope?
By J. P. FAURE and G. NIHOUL 245

PAGE

Atomic step and defect structure on surfaces of Si{100} and Si{111} observed by low-energy electron microscopy
By M. MUNDSCHAU, E. BAUER, W. TELIEPS and W. ŚWIĘCH 257

Instability origin of dislocation substructure
By J. KRATOCHVÍL and A. ORLOVÁ 281

Image effects between dislocations and grain boundaries
By O. KHALFALLAH, M. CONDAT, L. PRIESTER and H. O. K. KIRCHNER 291

Atomic structure of (111) twist grain boundaries in f.c.c. metals
By J. TH. M. DE HOSSON and V. VITEK 305

Direct evidence of dislocation transmission through $\Sigma=9$ grain boundaries in germanium and silicon by *in situ* high-voltage electron microscopy observations
By X. BAILLIN, J. PELISSIER, A. JACQUES and A. GEORGE 329

PART B

Critical current density and atomic structure of grain boundaries in high-T_c superconductors
By K. JAGANNADHAM and J. NARAYAN 129

Quantum interference in liquid metals
By N. F. MOTT and M. KAVEH 147

Quasicrystal model based on a series of supercubic crystal structures consisting of triacontahedra or Mackay icosahedra
By Q. B. YANG 155

Physical properties of icosahedral Al–Cr–Fe–Ge alloys
By V. SRINIVAS, R. A. DUNLAP, D. BAHADUR and E. DUNLAP 177

A simple model describing correlation functions and domain structure of the simulated ordering of AB alloys
By R. VETTER and C. M. VAN BAAL 189

Complex impedance and dipolar behaviour of a silver-doped chalcogenide
By K. K. SRIVASTAVA and ANIL VOHRA 201

Towards a unified view of polytypism in silicon carbide
By G. R. FISHER and P. BARNES 217

Electronic structure of amorphous silicon carbide compounds
By L. MARTÍN-MORENO and J. A. VERGÉS 237

Defect creation in the accumulation layer of a-Si:H thin-film transistors
By N. NICKEL, W. FUHS and H. MELL 251

PAGE

The influence of spatially non-uniform density-of-state distributions on the characteristics of a-Si:H thin-film transistors
By R. SALEH, R. SCHUMACHER and P. THOMAS 263

Determination of the density of states of the conduction-band tail in amorphous materials: application to a-$Si_{1-x}Ge_x$:H alloys
By C. LONGEAUD and R. VANDERHAGHEN 277

Book reviews 293

NUMBER 3—MARCH

PART A

An investigation of three-dimensional diffraction from 2Hb-MoS_2
By D. E. JESSON and J. W. STEEDS 363

Higher-order Laue zone diffraction from crystals containing transverse stacking faults
By D. E. JESSON and J. W. STEEDS 385

On the space group of aluminium oxynitride spinel
By V. P. DRAVID, J. A. SUTLIFF, A. D. WESTWOOD, M. R. NOTIS and C. E. LYMAN 417

Considerations of grain orientation and work hardening on short-fatigue-crack modelling
By E. R. DE LOS RIOS and A. NAVARRO 435

The effect of lattice misfit on the interface structure of equilibrated γ-Ag_2Al precipitates
By K. K. SAGOE-CRENTSIL and L. C. BROWN 451

Antiphase domain boundaries and their importance for dislocation behaviour in Ni_3Al based alloys
By D. G. MORRIS and M. A. MORRIS 469

Theoretical and experimental descriptions of grain boundaries in rhombohedral α-Al_2O_3
By H. GRIMMER, R. BONNET, S. LARTIGUE and L. PRIESTER 493

Errata 511

PART B

Glass–liquid transition in hyperquenched metal alloys
By S. RAM and G. P. JOHARI 299

Measurement of inelastic electron scattering cross-sections by electron energy-loss spectroscopy
By P. A. CROZIER 311

PAGE

A test-site method for the evaluation of the lattice-gas pressure in Monte Carlo simulations
By W. A. OATES, G. E. MURCH and S. H. LIM 337

Cathodoluminescence and X-ray analysis of defect reaction in Ag–CdS polycrystalline layers
By S. ACHOUR 347

Composition and structure of semi-insulating polycrystalline silicon thin films
By K. M. BRUNSON, D. SANDS, C. B. THOMAS, C. JEYNES and J. F. WATTS 361

Electronic transport in amorphous and microcrystalline phosphorus-doped silicon films prepared by thermal LPCVD
By K. P. CHIK, P. H. CHAN, B. Y. TONG, S. K. WONG and P. K. JOHN 377

Optical modulation spectroscopy of dangling bonds in a-Si:H
By W. GREVENDONK, M. VERLUYTEN, J. DAUWEN, G. J. ADRIAENSSENS and J. BEZEMER 393

On the formation process of the Staebler–Wronski effect in a-Si:H deduced from its wavelength dependence
By M. FATHALLAH 403

Trapping and recombination in amorphous hydrogenated silicon studied by dual-beam-modulated photoconductivity
By J. BULLOT, P. CORDIER, M. GAUTHIER and G. MAWAWA 413

Safe hole traps—a source of metastable light-induced dangling bonds in a-Si:H
By T. J. MCMAHON and R. S. CRANDALL 425

Effects of low-temperature measurement and light exposure on the gap-state density in a-Si:H
By WANG QIMIN, ZHU JIQIAN, XIE CHENGGANG, TAO WEI, ZHANG XIKANG and BAI GUOREN 437

Book reviews 443

NUMBER 4—APRIL

PART A

Structure images of *a*- and *b*-axis projections in $YBa_2Cu_3O_{7-\delta}$ superconductors observed by HREM at 200 kV
By Y. YAN and M. G. BLANCHIN 513

A transmission electron microscopy study of xenon bubbles in ion-implanted tin
By D. R. G. MITCHELL, S. E. DONNELLY and J. H. EVANS 531

Linear impurity structures and dipolar impurities in $KNbO_3$ single crystals
By S. G. INGLE and M. V. KOKATE 543

Phosphorus-enhanced diffusion in silicon induced by implantation damage: dependence on defect depth position
By P. NEGRINI, M. SERVIDORI and S. SOLMI 553

PAGE

Self-diffusion in body-centred cubic metals: analysis of experimental data
By G. NEUMANN and V. TÖLLE 563

Computer simulation of Zener pinning
By P. M. HAZZLEDINE and R. D. J. OLDERSHAW 579

Deformation of polysynthetically twinned crystals of TiAl with a nearly stoichiometric composition
By T. FUJIWARA, A. NAKAMURA, M. HOSOMI, S. R. NISHITANI, Y. SHIRAI and M. YAMAGUCHI 591

Low-temperature deformation in anthracene crystals
By KENICHI KOJIMA and ISAMU OKADA 607

Plastic deformation of GaAs single crystals as a function of electronic doping I: Medium temperatures (150–650°C)
By P. BOIVIN, J. RABIER and H. GAREM 619

Plastic deformation of GaAs single crystals as a function of electronic doping II: Low temperatures (20–300°C)
By P. BOIVIN, J. RABIER and H. GAREM 647

Dislocation mobilities and low-temperature macroscopic plasticity of III–V compound semiconductors
By J. RABIER and P. BOIVIN 673

PART B

Special Issue
Metastable Metallic Glasses: Principles and Applications

Editorial: Workshop on Metastable Metallic Phases: Principles and Applications
By U. VALDRÈ and E. A. DAVIS 447

Abstracts: Metastable Metallic Phases 449

Formation of amorphous metals by solid-state reactions
By L. SCHULTZ 453

Mechanical alloying of the Al–Ti system
By G. COCCO, I. SOLETTA, L. BATTEZZATI, M. BARICCO and S. ENZO 473

Formation of metastable crystalline phases in light-metal systems by rapid solidification
By H. JONES 487

Thermodynamic aspects of metastable-phase formation
By L. BATTEZZATI 511

Transformations of metastable phases
By A. L. GREER 525

PAGE

On the nature of the glass transition in metallic glasses
By A. VAN DEN BEUKEL and J. SIETSMA 539

Casting of ferromagnetic amorphous ribbons for electronic and electrotechnical applications
By A. LOVAS, É. KISDI-KOSZÓ, G. KONCZOS, L. POTOCKÝ and G. VÉRTESY 549

Characterization of powders obtained by comminution of $Fe_{40}Ni_{40}B_{20}$ amorphous ribbons
By E. ANGELINI, C. ANTONIONE and M. BARICCO 567

Magnetic properties of partially crystallized $Fe_{78}B_{14}Si_8$ amorphous alloys
By M. BARICCO, F. VINAI, P. ALLIA and C. ANTONIONE 579

Nanosecond laser-induced phase transitions and metastable phases quenching
By P. BAERI 587

Crystallization, resistivity and microstructure of metal–silicon thin-film alloys
By F. NAVA 601

Structural analysis of TiN_x films prepared by reactive-ion-beam-enhanced deposition
By D. C. KOTHARI, P. SCARDI, S. GIALANELLA and L. GUZMAN 627

Ion-induced crystal-to-glass transition in alloys
By P. M. OSSI 639

Structure and hidden symmetry in metallic glasses and quasicrystals
By J.-M. DUBOIS and C. JANOT 649

Icosahedral quasicrystals and magnetism
By R. C. O'HANDLEY, R. A. DUNLAP and M. E. MCHENRY 677

Surface characterization of $Fe_{75}B_{20}TM_5$ (TM ≡ V, Co) amorphous ribbons by X-ray photoelectron spectroscopy
By A. GLISENTI, G. GRANOZZI, R. BERTONCELLO, C. ANTONIONE, M. CASARIN and E. TONDELLO 691

Rapid heating of metallic glasses
By H. MATYJA and A. ZAŁUSKA 701

Structural relaxation in metallic glasses
By G. RIOTINO and M. BARICCO 715

On the reversible long-time kinetics of the magnetic permeability relaxation in amorphous ferromagnets: new investigations
By P. ALLIA, C. BEATRICE and F. VINAI 727

Experimental behaviour of the viscosity field against time and temperature in amorphous Metglas 2605 SC and CO ribbons
By R. CODA, A. MASOERO, P. MAZZETTI, E. SORRISIO and A. STEPANESCU 733

PAGE

The relation between enbrittlement and structural relaxation of an amorphous metal
By TSAI-WEI WU and F. SPAEPEN 739

Structural instability and transformations in amorphous metals studied by mechanical spectroscopy
By E. BONETTI 751

Kinetic and structural aspects of magnetic phenomena in amorphous soft ferromagnets
By P. ALLIA and F. VINAI 763

Magnetic and compositional order in transition-metal alloys
By J. B. STAUNTON, D. D. JOHNSON, B. L. GYORFFY and C. WALDEN 773

On the role of the electronic structure in order–disorder transformation of metallic alloys
By B. GINATEMPO, G. M. FLORIO, J. B. STAUNTON and B. L. GYORFFY 785

NUMBER 5—MAY

PART A

Interdiffusion in oxides (A, B)O (I): a numerical study of point-defect relaxation phenomena
By T. PFEIFFER and K. H. WINTERS 685

Interdiffusion in oxides (A, B)O (II): experimental investigation of point-defect relaxation on concentration profiles for MnO–FeO
By Y. UESHIMA, H. SCHMALZRIED and J. KOEPKE 707

Interdiffusion in oxides (A, B)O (III): oxygen evolution and vacancy relaxation in MnO–FeO solid solutions
By Y. UESHIMA and H. SCHMALZRIED 725

Mechanisms of swelling suppression in cold-worked phosphorus-modified Fe–Ni–Cr alloys
By E. H. LEE and L. K. MANSUR 733

Effect of residual and injected oxygen on swelling in irradiated Fe–Ni–Cr alloys
By E. H. LEE and L. K. MANSUR 751

Strain-induced amorphization of aluminium by manganese implantation
By C. A. MAJID 769

Plastic flow of B2-type CoTi single crystals
By T. TAKASUGI, K. TSURISAKI, O. IZUMI and S. ONO 785

Numerical evaluation method for the determination of grain-boundary diffusion coefficients from tracer concentration profiles for a constant boundary concentration
By B. SAAL, H. G. SOCKEL and M. HEILMAIER 801

Erratum 813

PAGE

PART B

The segregation of nickel-related optical centres in the octahedral growth sectors of synthetic diamond
By A. T. COLLINS, H. KANDA and R. C. BURNS 797

Simulation of field-ion-microscope images for the Al–Mn icosahedral phase
By H. A. FOWLER, A. J. MELMED and H. B. ELSWIJK 811

Soliton-like behaviour of a moving dislocation group
By A. PAWEŁEK and A. KORBEL 829

The structure of some Langmuir–Blodgett films. Part I. Substituted phthalocyanines
By J. R. FRYER, C. M. MCCONNELL, R. A. HANN, B. L. EYRES and S. K. GUPTA 843

Photostructural changes in amorphous $As_{50}Se_{50}$ films: an EXAFS study
By S. R. ELLIOTT and A. V. KOLOBOV 853

On the mechanism of photodoping in vitreous chalcogenides
By A. V. KOLOBOV, S. R. ELLIOTT and M. A. TAGUIRDZHANOV 859

Thermal equilibrium processes in carbon-based amorphous semiconducting ternary alloys
By F. DEMICHELIS and A. TAGLIAFERRO 867

***Ab initio* calculations on metastable defects in a-Si:H: the Staebler–Wronski effect**
By R. JONES and G. M. S. LISTER 881

Thickness-dependent structural transformation in PbSe–SnSe artificial superlattice
By ZENJI HIROI 895

Direct observation of anodic film growth on superimposed aluminium and tantalum metallic layers
By P. SKELDON, K. SHIMIZU, G. E. THOMPSON and G. C. WOOD 927

Book reviews 939

NUMBER 6—JUNE

PART A

Structure of decagonal Al_6Pd
By S. H. J. IDZIAK and P. A. HEINEY 819

Evidence for deep lattice damage in krypton-implanted titanium, revealed by positrons
By D. L. SMITH, P. C. RICE-EVANS and D. T. BRITTON 839

Diffusivity and mobility of lattice gases in lattices with randomly blocked sites
By M. BRAUN and K. W. KEHR 855

PAGE

Atomic structure of dislocations in silicon, germanium and diamond
By A. S. NANDEDKAR and J. NARAYAN 873

The photoplastic effect in GaAs, a model for device degradation phenomena
By E. DEPRAETÈRE, D. VIGNAUD, J. L. FARVACQUE, B. SIEBER and A. LEFEBVRE 893

The temperature dependence of the antiphase boundary energy in Ni_3Fe. I. The equilibrium value
By A. KORNER and G. SCHOECK 909

The temperature dependence of the antiphase boundary energy in Ni_3Fe. II. The evolution kinetics
By G. SCHOECK and A. KORNER 917

Effect of an internal stress on formation of stacking fault tetrahedra in an electron-irradiated Cu–Fe alloy
By N. ISHIKAWA and A. SATO 929

Crystal growth of radiating filaments of α-SiC formed by the conically converging shock-wave technique
By KENJIRO YAMADA and SHOTARO TOBISAWA 943

PART B

An electronic model for the $D0_{22}$ to $L1_2$ transformation of the group IVA trialuminides
By M. E. EBERHART, K. S. KUMAR and J. M. MACLAREN 943

Index of refraction and optical absorption in amorphous $Ge_{1-x}Sn_xSe_2$
By L. W. MARTIN, L. E. MCNEIL and J. M. MIKRUT 957

Calculation of some metallic glass properties, based on the use of a Gaussian distribution for the nearest-neighbour distance
By G. KNUYT, L. DE SCHEPPER and L. M. STALS 965

Light scattering from isolated stacking faults in natural diamond
By W. J. P. VAN ENCKEVORT 989

Experimental values of mixing entropy of liquid semiconducting systems
By R. J. HODGKINSON 1005

Mn-impurity-induced simple pair defect states in Bi-modified amorphous semiconductors $Ge_{20}S_{79\cdot5-x}Bi_xMn_{0\cdot5}$
By V. K. BHATNAGAR, K. L. BHATIA and VEENA BHATNAGAR 1021

PAGE

Polaronic hopping conduction in reduced lithium niobate single crystals
By A. DHAR and A. MANSINGH 1033

Book reviews 1043

Subject index 1047

Index of authors (with titles) 1055